

The **Cornell** Lab of Ornithology
BirdSleuth K-12

Life In A Nest:

Exploring Life Cycles With Bird Cams



Activities that explore life cycles through
streaming videos of nesting birds



The *Life In A Nest* activities are part of the BirdSleuth K-12 suite of educational resources from the Cornell Lab of Ornithology.

If you have questions about the BirdSleuth K-12 curriculum, please contact us.

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For additional background information, useful resources, and direct links to the resources described within this unit, please visit www.birdsleuth.org/nest.

Direct link to the Bird Cams: www.allaboutbirds.org/cams.



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The Cornell Lab of Ornithology is a nonprofit membership institution whose mission is to interpret and conserve the earth's biological diversity through research, education, and citizen science focused on birds.

Welcome to BirdSleuth!

The Cornell Lab of Ornithology's BirdSleuth K-12 program provides resources and training to educators. Our curriculum kits and free resources focus on learning to identify birds, participating in the Lab's citizen-science projects, getting outdoors, and doing science investigations. Through these activities, we hope to motivate students and encourage their interest in science.

These activities in this *Life in a Nest* resource were adapted from BirdSleuth's ***Nature Detectives*** and ***Habitat Connections*** curricula and the ***Citizen Science: 15 Lessons that Bring Biology to Life*** book, available from NSTA Press.

Visit the BirdSleuth website at www.birdsleuth.org/nest for resources, background information, and helpful links specifically created for *Life in a Nest*.

Introduction to *Life In A Nest*

Every year, the Cornell Lab of Ornithology Bird Cams bring excitement to classrooms by providing live, up-close views of nesting birds. Each nesting season, and at different times, you might catch hawks, owls, albatross, or bluebirds building nests, incubating eggs, and feeding young. These nesting birds bring a unique experience to your classroom and provide a fantastic learning opportunity for students.

This series of activities will help you make the most of Bird Cams in your classroom. If you haven't already, choose one species' Bird Cam to follow as you use this curriculum. Our goal is to guide you in supporting students as they watch the streaming videos (as well as archived footage and still photos), make careful observations, and collect data. These activities cover topics such as habitat, life cycles, bird diversity, and animal behavior. As you move forward with the activities, we hope you will begin to notice your students making connections to the natural world and to birds.

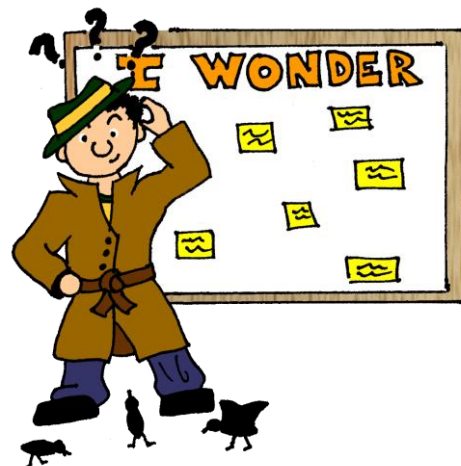
Activity Title	Key Science Content
1. Introducing Nesting Birds	Bird Biology, Life Cycles
2. From Nestling to Fledgling	Nesting Stages, Life Cycles
3. Create a Field Guide to Local Birds	Bird Behavior, Diversity of Life
4. Investigating Our Habitat	Habitat, Human Impacts

Creating an “I Wonder” Board

You might be surprised by how many questions will arise as you watch and journal about these nesting birds! Observation and questioning are important science practices. We want to empower kids to plan and carry out their own investigations and encourage their curiosity.

Keep track of student questions by creating an “I Wonder” board. We recommend that you make sticky notes available so kids can write their questions as they think of them and then easily affix the notes to the board. The questions can later be sorted by topic or type, creating another opportunity for learning.

The “I Wonder” Board will grow to provide a wealth of ideas that can form the basis of independent research. Students can return to questions in which they have a genuine interest. The *BirdSleuth: Investigating Evidence* module, also available as a free download on the BirdSleuth website, will help you lead students through their scientific investigations.



An “I Wonder” Board can be used to keep track of student questions.



“Investigating Evidence” compliments this unit and is available as a free download on the BirdSleuth website. It includes a Teacher’s Guide, Journal, and Resource pages.

Here are some sample questions you could explore with the Bird Cams:

- Does the male or female bird build the nest?
- How is the nest built? What materials are used?
- Do both parents incubate the eggs?
- Which parent feeds the nestlings? Does that same parent bring the food to the nest?
- What kinds of foods are fed to the chicks? Does the type of food change as the nesting season progresses?
- How often are nestlings fed? Does the feeding rate change during the day or throughout the nesting season?

Introduction to Citizen Science

Citizen science is members of the general public collecting data relating to the natural world and then collaborating with professional scientists by sharing their data with the scientists. When participating in citizen science, people everywhere use basic scientific procedures to report observations of natural events. Hundreds and thousands of participants all across the world contribute millions of observations every year, allowing scientists to ask questions they were never before able to answer.

Citizen science is a way for you and your students to learn about birds, science inquiry, and conservation by contributing to scientific studies. This partnership between the public and professional scientists constitutes one of the world's largest research team! Throughout these activities, we will mention the opportunity to expand the lessons and participate in citizen science projects. You'll find support for these projects on the BirdSleuth website and individual project pages.

A Word of Caution...

Viewing the Bird Cams is an opportunity to witness an intimate view of nature as it is, without interference. Students love the “real life” nature of the cams. But because this is a live broadcast in real time, it’s possible that you will see potentially upsetting events (mating, predation, fighting, injury, or death). If you have chosen to watch a raptor’s nest, for example, you will most likely see small animals being eaten. Thoughtful preparation of your students can make the difference between a shocking sight and a learning opportunity. Discuss in advance what you may see, why these things occur, and preview the appropriate responses to surprising things on camera (i.e. not yelling, “Eww!” or hiding under desks).

Now, get started with Bird Cams, and see what you discover! Select a species if you haven’t already, and start watching. Don’t forget to visit the BirdSleuth website at www.birdsleuth.org/nest for resources to help you get the most from Bird Cams and *Life in a Nest*.



Activity 1: Introducing Nesting Birds

Goal: Students confront some common misconceptions about nesting birds.

Time and Location: 30 minutes, indoors or outdoors

Resources Needed

- A large enough space for students to move around

Conducting the Activity

Establish "fact" and "fiction" sides of the room or outdoor space—at one extreme is the "fact" side, and at the other, the "fiction" side. You may wish to label each side to avoid confusion. As you read aloud the following statements, ask students to move to one side or the other depending on whether they think the statement is true (fact) or false (fiction). Ask several students to explain their opinion. After the vote is established, reveal the correct answers.

1. **All birds build nests.** (*Fiction - Some birds don't build a nest. The Peregrine Falcon will lay its eggs right on a ledge; the Brown-headed Cowbird lays its eggs in the nests of other birds.*)
2. **Only the female sits on (incubates) the eggs.** (*Fiction - It depends on the species. Only the female Osprey and Great Horned Owl incubates the eggs while both the male and female Laysan Albatross and American Kestrel sit on the eggs.*)
3. **Most songbirds live in their nests year round.** (*Fiction - Nests are mainly used for laying eggs and raising young. They are usually not used after the nesting season is over. The exception is some cavity nesting birds that will use the cavity year-round, for example, the Barn Owl.*)
4. **Most baby birds are fed seeds and berries by their parents.** (*Fiction - Most baby birds are fed insects by their parents—insects are high in the protein they need to grow.*)
5. **Chicks can breathe inside their eggs before they hatch.** (*Fact - The eggshell is porous and the growing chick needs to breathe air. Gas exchange happens through the shell.*)
6. **Eggshells are made of the same materials as chalk.** (*Fact - Both are made primarily of calcium carbonate.*)
7. **The egg yolk (yellow part) grows into a baby bird.** (*Fiction - The yolk provides food for the growing baby bird, which is at first just a small dot of cells attached to the yolk.*)
8. **If you find a baby bird, you should try to feed it.** (*Fiction - If you find a tiny nestling, try to put it back in the nest as soon as possible. If you find a fledgling, unless there is some immediate danger, for example, if the fledgling is in the road or a predator is nearby, it is actually best to leave it alone.*)

9. **If you return a baby bird to its nest, the parents will smell your scent and reject it.** (*Fiction - Parent birds do not recognize their young by smell. If you find a nestling on the ground, it's okay to return it gently to its nest, which is almost certainly nearby.*)
10. **All birds will nest in birdhouses.** (*Fiction - Only bird species that typically nest in cavities will use birdhouses or nest boxes.*)

You may want to privately note any widely held misconceptions for further discussion.

Reflect and Evaluate

1. What facts surprised you about nesting birds?
2. Do all bird nests look alike? What do different bird nests look like? Where are they found? What kinds of materials might a bird use to build a nest? (*Bird nests are highly variable and can be found on the ground, in bushes, high in the branches of trees, in nest boxes, or tree cavities. The materials birds use to make their nests vary from species to species, and include sticks, leaves, moss, vines, feathers, spider webs, mud, bark, and human-made materials such as string, paper, or fabric scraps.*)
3. Why do birds build nests? (*Nests protect eggs and young and help keep them warm.*)

Extensions

1. Challenge students to come up with their own “fact or fiction” questions about birds and then research the answers. Give each student a chance to question the class.
2. Ask students to research, draw, and describe “cool facts” about nesting birds, for example, extreme birds (largest/smallest egg, nest, and clutch size). Share these stories, drawings, and interesting facts with the class.
3. Have students share any personal experiences with birds. This can be a writing opportunity or a whole group discussion. Based on these experiences, what additional questions do students have? Remember to make use of the “I Wonder” board.

Activity 2: From Nestling to Fledgling

Goal: Students learn about the structure and functions of birds' nests. They will also learn the stages of nesting and how birds behave in each stage.

Time and Location: 55 minutes, indoors

Resources Needed

- Nesting Cycle Charades cards (page 22) (depending on the size of your group you may need to copy and cut two sets)
- Internet access

Conducting the Activity

Review the following vocabulary with your students (see the glossary on pages 18 and 19 for definitions):

- | | | |
|-------------|-------------|-------------|
| • Nestling | • Altricial | • Territory |
| • Fledgling | • Precocial | • Mate |
| • Chick | • Incubate | |

Lead a discussion of students' previous experiences with bird nests to help you gain insight about what students already know so you can build on prior knowledge, as well as correct any misconceptions. Consider asking the following questions:

- **Why do birds build nests?** (*Nests provide a protected, hidden place for eggs and young.*)
- **What does the nest of our Bird Cam species look like? What is it made of? Where is it?** (*Answers will vary according to Bird Cam species you have chosen. Students can research nesting information and then compare that to what they observe on the Bird Cam.*)
- **What do other bird species' nests look like? Where are they found?** (*Bird nests are diverse; some are shaped like a bowl, others like a hanging sock, still others take the shape of the tree cavity where they're built. Nests can be found high up in tree branches, in low bushes, in tree cavities or nest boxes, or even on the ground. Keep in mind, the large leafy nests we see in trees during the winter are squirrel nests called dreys, not bird nests.*)
- **What kinds of materials might a bird use to build a nest?** (*Sticks, leaves, moss, vines, feathers, lichen, spider webs, mud, bark, and human-made materials such as string, plastic, or fabric scraps.*)
- **Have you seen a bird build a nest? At what time of year?** (*Almost all North American birds build their nests in spring although some like the Barred and Great Horned Owls begin nesting in late winter.*)

- **At what time of year have you seen a nest? Did it have eggs in it?** (*Nests are used during the breeding season. Most birds don't live or sleep year-round in their nests; nests seen at other times of the year may be abandoned or will not be used until next year. An exception is cavity-nesting birds, which may sleep in their nest cavities year-round.*)
- **Have you seen a baby bird (nestling)? Where was it? What did it look like?** (*If students haven't seen chicks before, show them a picture. At hatching, some young birds are entirely dependent on their parents (altricial) like songbirds, woodpeckers, and hummingbirds, while others are able to leave the nest and begin finding their own food within hours of hatching (precocial) for example, waterfowl and shorebirds.*)
- **Most birds only breed in the spring and summer rather than throughout the year. Why do you think that is?** (*Food availability is highest during the summer.*)

Nesting Cycle Charades

Breeding birds behave in different ways during each stage of the nesting cycle. To help students understand what they might see on the Bird Cams, play the Nesting Cycle Charades game using the cards found on page 22. Write the following stages of the bird nesting cycle on the board:

- | | |
|--------------------------------|----------------------------|
| 1. Find and defend a territory | 4. Incubate eggs |
| 2. Find a mate | 5. Feed and raise nestling |
| 3. Build a nest and lay eggs | 6. Nestlings fledge |

Divide students into groups of 2-4 students, and ask each group to draw one card. (What is written on the card should be shared only with the other members of the group.) Then, the students attempt to act out the stage that is described on the card. The rest of the students in the class can refer to the nesting stages listed on the board as they try to guess which stage is being depicted by their classmates.

Reflect and Evaluate

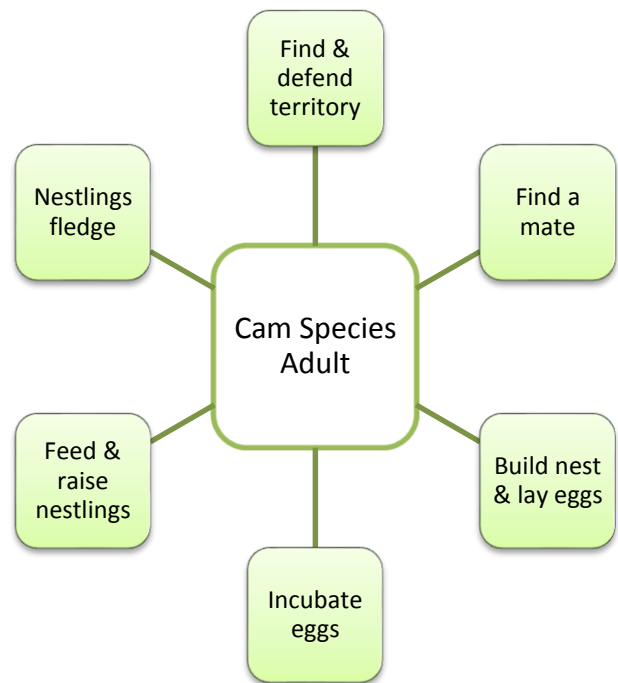
1. How does the behavior of birds change during the breeding season? (*Students might consider when birds are more/less active or quiet, what the young are doing, what the parents are doing.*)
2. At which nesting stage do you think birds are most vulnerable and why? (*Have students use their knowledge of the species they have viewed on the Bird Cam to discuss the challenges of each stage. With further research students can compare their species to other species' experiences during the nesting stages.*)

Extensions

1. Ask students to predict when the eggs will hatch in the nest you are monitoring and when the young will fledge from the nest. This could be done as a short writing activity or as a game. Older students could research the length of each nesting stage and make informed predictions in the form of a paragraph or two. Younger students could make predictions

after a short class discussion. Students whose guesses are closest to the actual hatch date could be rewarded in some way.

2. Birds create nests out of the materials they find outside. Take students outside and let them collect some “nesting material” or you can do this ahead of time. Have students work in groups of 3-5 to try to build their own bird nest (see photo below) from the collected material. When the nest is constructed, find some egg-shaped rocks to test it out!
3. Build nest boxes to house cavity nesting birds. See the BirdSleuth website for links to help with this. Monitor your nest boxes with the NestWatch citizen science project.
4. Provide students with a blank piece of paper. Have them draw a circle in the middle big enough to sketch an adult bird inside. Then have them draw lines or spokes from the circle to the edge of their paper to form six, fairly equal sections around the circle. You may wish to have a model for them to copy. Students then label each section, in order, with the six stages of nesting behavior. In the circle, have students sketch and label an adult bird of your Bird Cam species. Then in each section around the circle using a combination of pictures and words depict the behaviors they might observe during that stage of nesting.



Students get creative and crafty when they work together to build a bird nest. If they think building a nest with their hands is hard, remind them that birds build their nest with only their beaks and feet!



Activity 3: Create a Field Guide to Local Birds

Goal: Students look and listen for birds outdoors and then create a Nesting Bird Field Guide.

Time and Location: Two (or more) 55-minute blocks of time, indoors and outdoors

Resources Needed

- Bird Observation Journal Page, one per student (page 20)
- Computers with Internet access and/or bird field guides
- Paper and drawing utensils to create the local bird field guide
- Common Local Birds list for your region (See <http://www.birdsleuth.org/nest.>)
- BirdSleuth focus game cards (optional) (Available at www.birdsleuth.org/502.)
- 3-ring binder
- White board

Conducting the Activity

Bird Behavior Walk

Give students a copy of the Bird Observation Journal Page, found on page 24, on a clipboard or other hard surface. Tell them they are looking for birds in order to record any behaviors or sounds they may notice. If they know the species, they should record that as well. If they don't know the species, have students make notes of size, shape, and color to help identify it later using a field guide.

Now, take your students outside on a bird behavior walk. Remind them to move quietly using their eyes and ears to collect information. Using the Bird Observation Journal Page, have students record the behaviors and sounds they notice. Be sure to make note of the date and time you are observing birds, and approximately how far you walk.

When you return to the classroom (or during a later class period), give students the opportunity to share their observations. Ask:

- Were you able to identify any of the species you saw? What were they? Did anyone else see that species?
- Were there birds you could not identify?

As a class or in small groups, try to identify unknown species using resources available to you (field guides or online resources). Create a list on the board of all the species you observed. Now, ask:

- What are some behaviors we saw?
- Were more than one species observed doing the same behavior?
- What sounds did you hear birds making? Could you identify the species making the sounds? Do you think you have heard these sounds before? When? Where?

You may wish to repost the list of nesting behaviors from Nesting Cycle Charades.

- Are any of the behaviors you observed ones that we have discussed as being part of the nesting cycle? Which ones? What behaviors are not part of the nesting cycle? (*The nesting behaviors are: find and defend a territory, find a mate, build a nest and lay eggs, incubate eggs, feed and raise nestlings, nestlings fledge. Students should categorize what they observed according to this list of nesting behaviors. Not all behaviors will be able to be categorized in this way, for example, flying, preening. Include another category called "Other" to contain these behaviors.*)

Begin a list on the board of the behaviors observed on your bird behavior walk and label them according to the six nesting cycle behaviors.

- Which of the behaviors on this list are breeding/nesting behaviors? Which would be seen at other times of the year? Why do you think that?
- What questions do you still have about bird behaviors (*Add these to the "I Wonder" board.*)

Nesting Birds Field Guide

Using the behaviors observed during the walk, what students have learned from watching the Bird Cam, and from Nesting Cycle Charades, they will now create a Local Nesting Birds Field Guide as a class.

Show students examples of general field guides. There are also field guides available specifically on the subject of nests and eggs. Check your local and school libraries. Also, show the Lab of Ornithology's All About Birds online field guide.

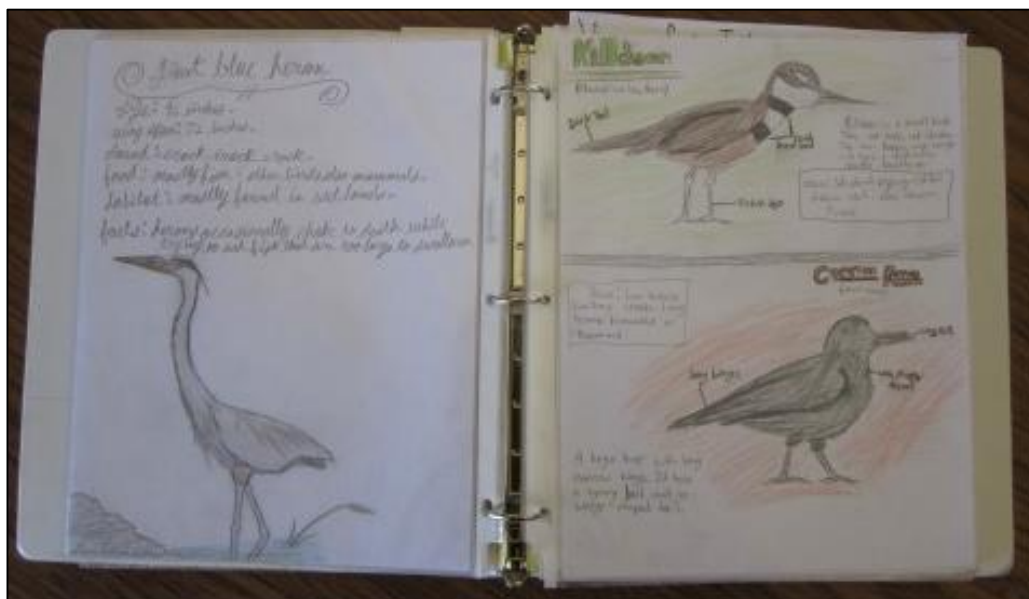
Have students look through all the examples you are able to provide. Then ask,

- What do you notice is included in general bird field guides? (*Common and scientific name, identification (size, shape, colors, and field marks), where it lives and its preferred habitat, diet, general behavior, and cool facts about the species.*)
- What information do we want to include in our Nesting Birds Field Guide? (*In order to increase your student's bird identification skills, including some of this general bird information listed above will be helpful, but it isn't necessary to include everything. Let your students decide, if possible.*)
- What features do you think would be important to include in our field guide? (*The information you decide to incorporate could include a description of adult behaviors during the six nesting stages, description of the bird's nest, eggs, and chicks (including their condition at hatching), and the kind of nesting facts found on the All About Birds website: clutch size, number of broods, lengths of incubation and nestling periods.*)
- How should we format our entries? Do all our entries need to be consistent? Why or why not? (*Looking at the examples, have students discuss and decide how each entry should be formatted. Beyond the bird, what else should be illustrated for each entry? Nest? Egg? Chick? Field guides employ a consistent format to make it easier to find information.*)

Create a list of the features and categories of information you have decided to include in your guide. If possible, provide a model or prototype of a page for students to refer to as they make their individual pages.

Assign each student one local bird on which to focus. Invite them to make an accurate sketch representative of his or her focus bird and label its distinguishing field marks. (There are online tutorials to help children learn how to realistically draw birds or, if you have an art teacher at your school, ask him or her for some tips or instruction for your class.) Then, students will begin to add the descriptions and illustrations that they agreed to include.

Depending on what your vision is for the final product, after students have gathered all the information about their species, you may wish to have students work together during the final production stage. Some students may be better illustrators while others may have better handwriting or keyboarding skills. Finally, create a binder containing all the sketches to use as a class reference (see sample binder below). You may wish to display the binder in your school library or other public area.



Reflect and Evaluate

1. Why is the information that is included in a field guide important to include? What is its purpose?
2. How is the nesting cycle of the bird you researched similar to and/or different from the nesting cycle of our Bird Cam species?
3. How are the characteristics of the birds you researched similar to each other? (For example, all have feathers and beaks.) How do they differ? (Size, shape, colors, and life history details.)

Extensions

1. Do the Bird Behavior Walk every month or two to document seasonal changes.
2. Consider using our BirdSleuth Focus Game Cards (which feature 5×7 images of common birds and lots of information about each one) to teach bird ID and facts about each bird.
3. If your group likes observing birds, consider counting your local species and submitting your totals to eBird.
4. Take students outside to look for nests and have them try to determine the species of bird using the nest. You might want to scout for nests beforehand, as they can be difficult to find. Prior to heading outside to look for nests with your students, be sure to set some guidelines so that you don't disturb the nesting birds as you observe them. Visit the Cornell Lab's *NestWatch* website and search for their *Code of Conduct* to help. If you find a nest or build a nest box, consider monitoring it through the *NestWatch* citizen-science project.

Activity 4: Investigating Our Habitat

Goal: Students will examine their local habitat to see if it provides the food, water, cover, and space nesting birds require.

Time and Location: 55 minutes, indoors and outdoors

Resources Needed

- Computer with Internet access
- Introducing Habitats article (page 23-24), one per student or group
- Map That Habitat Journal Page (page 21), one per student

Background Information

Birds eat seeds as well as insects and other animals, fruits, berries, nuts, and nectar. Adding bird-friendly plants to your schoolyard helps to provide birds with important food and cover that wouldn't otherwise be available. A greater diversity of vegetation supports a greater diversity of foods (including insects) that birds can eat and feed to their young, resulting in more diverse and abundant bird life. Native plants are most valuable because they support the insect populations needed by birds to feed their young.

Conducting the Activity

Read the Introducing Habitats article (page 23-24) aloud as a group or provide copies to be read independently.

Go outdoors and have students map and/or describe in writing their schoolyard or local habitat. Be sure to have them include the information from the Introducing Habitats handout and the Map That Habitat Page. Sometimes it's helpful to tell the students to draw it as if they were a bird looking down while flying overhead. You might also consider using Google Earth to create and print a map of your schoolyard for students to reference.

When mapping, students should sketch the boundaries of areas covered by pavement, buildings, lawn, grasses, flowers/herbs, shrubs, forest, water, wetlands, and bare ground. Then they should think about where birds might find food, water, and cover and label these on their maps—indicate bird-friendly plants or objects such as bird feeders, water sources, and brushy areas.

Discuss as a group:

- Are there any differences between what we thought our local habitat was like and what we actually saw when we went outside and mapped it?
- How is the habitat around the school similar to our Bird Cam species habitat? How is it different?

- Given what you learned about the habitats the Bird Cam species preferred, do you think any might live in the area around our school? Why or why not?
- Is it possible to change the local habitat in order to attract any of the Bird Cam species? Is it reasonable for us to try to do so?
- How or where do the birds in our local habitat get the water, food, and cover they need?

Ask students to brainstorm words to describe your local habitat and write them on the board.

Remind students of the key factors necessary for habitat to support a bird (*food, water, cover, and space*).

Research the habitat requirements of one or all of the Bird Cam species using the *All About Birds* website at www.allaboutbirds.org, field guides, or other resources. Compare the habitat needs of the Bird Cam species to the words students used to describe the local habitat. Ask,

- Which of the Bird Cam species *could* live where we live? Why?
- Which of the Bird Cam species *could not* live where we live? Why not?

Reflect and Evaluate

1. What positive and negative impacts do people have on nesting birds? What can we do to help nesting birds? (*There are many ways people can affect the nesting, feeding, and roosting of nesting birds. The major one being the loss of habitat due to development. Pets, off-road vehicles, boats, and other outdoor activities can also disturb birds. On the other hand, humans can positively impact nesting birds by planting native plants, adding water to an area, and putting up nest boxes. Bird species like Osprey, House Wrens, bluebirds, Wood Ducks, and Barn Swallows are just a few of a number of species that make use of man-made structures and boxes to establish their nests.*)
2. Do you think the area around our school is a good place for birds to live? Why or why not? Is our habitat a good place for birds to nest? Why or why not? What might be missing? (*Be sure to emphasize that the habitat will be good for SOME birds—those that have adaptations to survive and/or reproduce in your particular environment.*)
3. How does our schoolyard/site currently provide the food, water, space, and cover that birds need? What are one or more steps you would propose for improving our habitat for birds? (*Students should mention all four factors - food, water, cover, and space - as well as give reasonable suggestions for improvement related to habitat. For example, hang bird feeders with nearby cover; plant native wildflowers, fruit-bearing trees, or shrubs; put up a birdbath; clean up trash; or install nest boxes.*)
4. What could you improve in our schoolyard or homes to make it a better habitat for birds? (*Whether students have a backyard or a balcony, making and hanging homemade bird feeders and water sources and being sure pet cats are kept indoors are all ways most students can improve the area around their home for birds*)

5. If you were a bird, would you rather nest in a hole (cavity) of a tree or on a branch? What challenges and benefits might you have in each place? *(A hole is warmer and safer from predators, but there is intense competition for tree cavities, and nest boxes. Eggs and young can't easily fall out of a cavity nest, but there is only one way out. A cup nest on a branch is cooler, offers more escape routes, and fewer parasites; however, it is more visible and vulnerable to predators and is not as weatherproof.)*

Extensions

1. Implement one or more of the habitat improvements the class suggested above (for example, plant native plants, put in a bird bath or feeder). Submit your bird-friendly actions to the BirdSleuth Action Map (and have a chance to win grants and prizes).
2. Review the "I Wonder" Board and investigate any scientific questions the students would like to address. BirdSleuth's *Investigating Evidence* (free download) can help.

Glossary

Altricial—describes young, sometimes blind; birds without feathers that cannot move around or care for themselves after hatching and need full parental care

Breeding—mating and producing offspring

Breeding season—the period of time during each year when a species reproduces (mates and has young)

Brood—all the chicks in a nest

Brood patch—an area that develops on the lower abdomen of birds, where the feathers drop off and the skin thickens and becomes densely populated with blood vessels; used in incubation to keep eggs and young warm. Also known as incubation patch.

Cavity—hole in a tree where a bird can build its nest; cavity-nesting birds may also use these cavities as a roost for sleeping year-round

Chick—baby bird

Clutch—all the eggs laid in a nest

Common name—a bird's non-scientific name; for example, *Ceryle alcyon* is also known by its common name, Belted Kingfisher

Courtship display—specific bird behavior intended to attract a mate or to bond with a mate when both sexes display together

Egg—an oval or round object laid by a female bird, reptile, fish, or other animal, containing the embryo; bird eggs are covered by a hard shell

Field guide—a book with illustrations, range maps, and descriptions of various species; most bird field guides group birds according to their taxonomic order, with related species nearest each other, instead of alphabetically

Fledge—to leave the nest

Fledgling—chicks that have started leaving the nest for short periods, or have just left the nest; usually still get parental care; starting to fly

Habitat—the area in which an animal lives; can be described by the sources of food, water, shelter, and space availability found there

Incubate—to sit on eggs to warm them while the chicks inside are developing

Mate—(noun) a breeding partner of the opposite sex; two mates together produce offspring; (verb) to breed and produce offspring

Migrate—to move regularly from one part of the world to another, usually in spring or fall

Nestling—chicks that still live in the nest and are fed by their parents

Nest box—a box, usually made of wood, constructed as a place for birds to build their nest and/or lay their eggs, sometimes called a birdhouse; only birds that naturally nest in cavities will use nest boxes

Plumage—a bird’s feathers, including the colors and patterns

Porous—having small holes, not visible to the human eye, that allow liquid or gas to pass through

Precocial—describes young birds that are able to move around shortly after hatching and have some feathers and sight; some may be able to feed and take care of themselves

Predator—an animal that eats another animal

Resident—a bird that lives in the same place for the entire year and does not migrate

Scientific name— a bird’s internationally standardized name, which has two parts (genus and species) and is written in Latin or Greek; for example, the Belted Kingfisher’s scientific name is *Ceryle alcyon*

Species—the most specific classification of organisms; birds grouped in the same species can breed with each other and generally share common habitats, appearance, and behavior

Territory—an area that an animal or group defends from other animals of the same species and uses for breeding

Yolk—the yellow part in an egg that provides nutrition for the growing chick

Bird Observation Journal Page

Name: _____

Date: _____ Location: _____

Habitat Description: _____

Species name	What do I look like? (draw or sketch)	What do I sound like?	How am I behaving? (perching, eating, singing, etc.)	Number seen

Map That Habitat Page

Name: _____

Location: _____

Draw a map of your schoolyard in the space below:



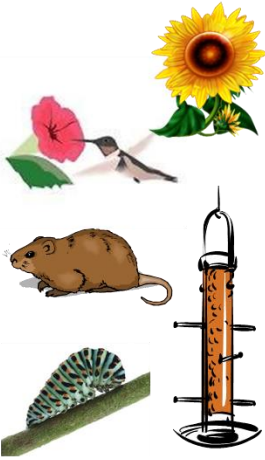
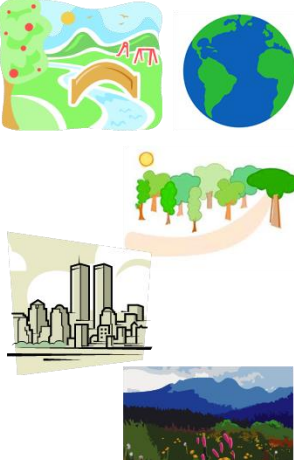
Where might birds find food, water, and cover? Label these spaces on your map.

Nesting Cycle Charades Cards

Find and Defend a Territory Before laying eggs, some birds find a nesting territory and defend it from other birds of the same species. Good territories have the food, water, and cover a bird needs. Birds defending their territory often perch out in the open, singing loudly. If another male bird gets too close, the singing male may show aggression by puffing up its feathers and looking ready to strike.	Find a Mate Males often attract by singing, drumming, or calling. For most bird species, the female chooses her mate. This is one reason why males are often “showier” or more colorful than females. In addition to singing, some males do courtship displays. This can include special flights, displays with their tails or wings, and dances.
Build a Nest and Lay Eggs Nests provide a safe place for the eggs and young. Birds build nests out of all sorts of things—sticks, leaves, moss, vines, mud, animal hair, and their own feathers. Nests can be found almost anywhere: on the ground, in trees, on the sides of cliffs, on buildings, and bridges. Most songbirds lay between 3-6 eggs. Some birds lay more, and some less.	Incubate Eggs Bird eggs need to be kept warm (incubated) in order to survive. People usually say birds are “sitting on their eggs” at this stage. Usually the female incubates, or the parents take turns. The parents have a “brood patch” on their belly, where there are few or no feathers, so their skin warms the eggs. Parent birds are usually quiet while they incubate so they don’t draw attention to the nest.
Feed and Raise Nestlings For the first week or more, nestlings must be kept warm and fed. The parents feed the chicks almost constantly, flying back and forth with food for their young. The young birds open their mouths wide and cry out loudly for food whenever their parents are near.	Fledge From the Nest After leaving the nest, young birds usually stay close to parents for a time. These young birds must learn to survive on their own. They are very vulnerable to predators. Many fledglings continue to beg for food from their parents. They might open their mouths, flutter their wings, and call for food.

Introducing Habitats

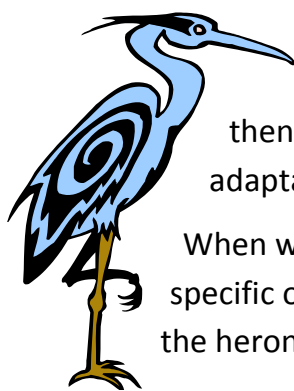
Every living thing has a **habitat**—a place where it normally lives and grows. Every habitat includes four important features: food, water, cover, and space.

Food	Water	Cover	Space
Different birds eat different foods.	To drink, bathe, or find food in.	To hide from predators and bad weather.	An area with enough food, water, and cover.
			

Birds (and other organisms) need the right habitat to survive. The type and amount of habitat they need depends on what they eat, how they find food and water, and what they require in their nesting site. Some bird species can live in a wide range of habitats while others have more specific habitat requirements.

All species have adaptations that allow them to live where they do. A bird can't live just anywhere because not all areas meet its specific needs. Adaptations are the characteristics that help it to live and reproduce in its habitat. These features have been shaped by a process called natural selection. When you look at an animal, consider three types of adaptations it has for living where it lives:

1. Physiological (involving the cells or organs)
2. Structural (parts of the body like wings, bills, feet)
3. Behavioral (actions such as hunting techniques)



For example, this heron has a long, pointy bill for catching and eating fish, and long legs so it can wade in water. The bird stalks its prey quietly, and then quickly stabs it with its sharp bill. These structural and behavioral adaptations make it well-suited for living in wetland environments!

When we talk about habitat, look at the environment from the perspective of a specific organism, such as the heron. In this case, “habitat” refers to the things that the heron needs in order to survive and reproduce there.

Habitat Notes for some of the Bird Cam species

Great Blue Heron This species lives in both saltwater and freshwater habitats: open coasts, marshes, rivers, ponds, and lakes. Breeding birds usually gather in colonies or “rookeries” to build stick nests high off the ground. They eat nearly anything within striking distance, including fish, amphibians, reptiles, small mammals, insects, and other birds.	Red-Tailed Hawk Red-tailed Hawks occupy just about every type of open habitat on the continent: deserts, grasslands, roadsides, fields and pastures, parks, and even the tropical rainforest of Mexico. They typically nest in a tall tree or on cliff ledges. Mammals make up the bulk of most Red-tailed Hawk meals, including voles, mice, wood rats, rabbits, snowshoe hares, jackrabbits, and ground squirrels.
Barred Owl Barred Owls live in mixed forests of large trees, often near water. They tend to occur in large, old woodlands that have large tree cavities to nest in. They eat many kinds of small animals such as squirrels, chipmunks, mice, voles, rabbits, birds, amphibians, and reptiles. They hunt by sitting and waiting on an elevated perch, while scanning all around for prey with their sharp eyes and ears.	Laysan Albatross Laysan Albatrosses range across the northern Pacific and forage in colder, food-rich waters. They nest on open, grassy, or sandy expanses of islands—particularly Midway Atoll and Laysan Island. They eat mainly squid as well as fish eggs, crustaceans, floating carrion, and some discards from fishing boats. They feed by sitting on the water and plunging with their beaks to seize prey near the surface.

Questions to consider:

1. What are some similarities between the preferred habitats of these four species? What are some differences?
2. Which of these species might live in your area? Do you think the species might nest in your area?